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## SYNOPSIS OF NORTH-AMERICAN INVERTEBRATES.

### I. FRESH-WATER BRYOZOA.

C. B. DAVENPORT.

THESE minute animals are found very abundantly in ponds and streams. Upon the underside of floating boards or of fallen tree trunks, in quiet pools or ponds, one may find the branching *Plumatellas* and *Fredericella*; upon rocks one often finds the *Plumatella punctata* in crowded masses. In pond-bottoms or in slow-moving streams *Cristatella* may be found on leaves of aquatic plants or bottom *débris*. More rapid streams afford *Paludicella* and *Pottsiella*. Below milldams, where the waters are turbulent, *Urnatella* and *Pottsiella* have been found together on stones. In reservoirs near where the waters are being pumped in, or on the gates of milldams, one may look for *Pectinatella*. Since all species form colonies by budding, compounds of Bryozoa may be formed of great size. Some of the *Plumatella* colonies stretch over a plain surface six inches in diameter, and a *Pectinatella* colony may become by the end of summer a sphere two feet or more in diameter. Bryozoa prefer the shade, and hence are more apt to occur in places not directly illumined by the sun's rays.

Fresh-water Bryozoa pass the winter in an inactive stage. The *Phylactolæmata* produce little seed-like bodies called statoblasts. These may be found as minute brown bodies floating on the surface of ponds in the winter and spring. If some of these are brought indoors in the early spring, they will hatch out after a few days, revealing a double embryo, which is one of the most beautiful objects for microscopic observation. The food of fresh-water Bryozoa consists of minute plants suspended in the water, such as diatoms.

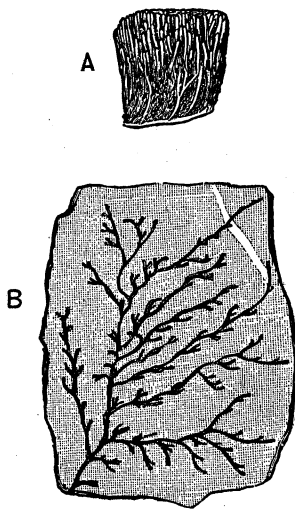


FIG. 1. — A, *Plumatella polymorpha*, var. *fungosa*, small part of mass, natural size. B, *Plumatella polymorpha*, var. *repens*, on leaf of water lily, natural size. From Cambridge Natural History.

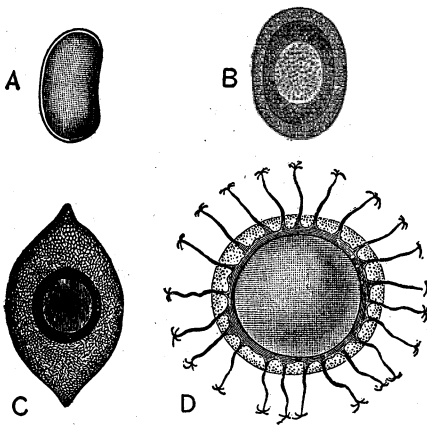


FIG. 3. — Statoblasts of Phylactolæmata. A, *Fredericella sultana*  $\times 38$ ; B, *Plumatella polymorpha*  $\times 38$ ; C, *Lophopus cristallinus*  $\times 28$ ; D, *Cristatella mucedo*  $\times 28$ . From Cambridge Natural History.

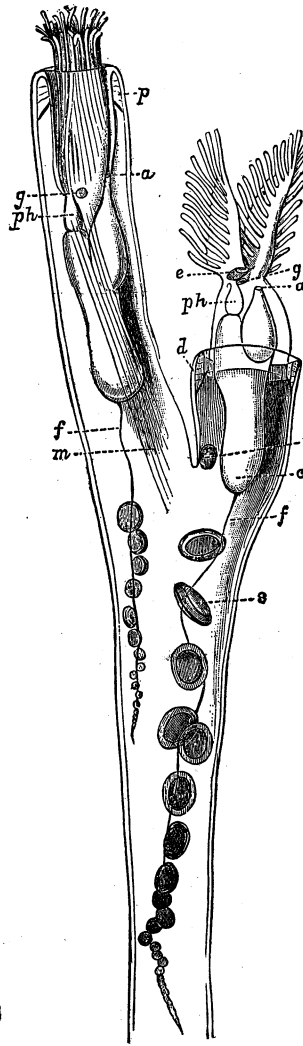


FIG. 2. — *Plumatella polymorpha*, var. *repens*  $\times 30$ . a, Anus; b, polypide-bud; c, cæcum of stomach; d, duplication or kamptoderm; e, epistome; f, funiculus or germinal strand; g, ganglion; m, retractor muscle; p, parieto-vaginal muscles; ph, pharynx; s, statoblasts developing on funiculus. From Cambridge Natural History.

KEY FOR THE DETERMINATION OF AMERICAN FRESH-WATER  
BRYOZOA.<sup>1</sup>

- a*<sub>1</sub>. Anus opening inside the tentacular corona [Endoprocta]. *Urnatella gracilis*.
- a*<sub>2</sub>. Anus opening outside the tentacular corona, which is capable of being retracted [Ectoprocta].
  - b*<sub>1</sub>. Zoëcia sharply separated from each other; no epistome [Gymnolæmata].
    - c*<sub>1</sub>. Zoëcia cylindrical, arising from stolons; aperture terminal. *Pottsiella erecta*.
    - c*<sub>2</sub>. Zoëcia club-shaped, no stolons; aperture lateral. *Paludicella ehrenbergii*.
  - b*<sub>2</sub>. Zoëcia confluent, epistome present [Phylactolæmata].
    - c*<sub>1</sub>. Statoblasts without thorns, rounded at ends.
      - d*<sub>1</sub>. 20–22 tentacles arranged nearly in a circle; statoblasts without peripheral float. *Fredericella sultana*.
      - d*<sub>2</sub>. 38–60 tentacles arranged in form of horseshoe. Free elliptical statoblasts with a peripheral float [Plumatella].
        - e*<sub>1</sub>. Free statoblasts elongated; proportions, 1 : 1.53 to 1 : 2.8. *Plumatella princeps*.
        - e*<sub>2</sub>. Free statoblasts nearly circular, 1 : 1 to 1 : 1.5.
          - f*<sub>1</sub>. Free ends of zoëcia fairly distinct from basal tubes, cylindrical or irregularly constricted. *Plumatella polymorpha*.
          - f*<sub>2</sub>. Free ends of zoëcia mere conical elevations of basal tubes, covered with white spots. *Plumatella punctata*.
    - c*<sub>2</sub>. Statoblasts acutely pointed at both ends, without thorns. *Lophopus cristallinus*.
    - c*<sub>3</sub>. Statoblasts with anchor-shaped thorns.
      - d*<sub>1</sub>. Zoöids form rosettes on a gelatinous base, often attaining great size. *Pectinatella magnifica*.
      - d*<sub>2</sub>. Stock caterpillar-like, with broad sole. *Cristatella magnifica*.

*Literature on Fresh-Water Bryozoa*.—Allman, G. J., A Monograph of the Fresh-Water Bryozoa, London (*Roy. Soc.*), 1856. — Hyatt, A., Observations on Polyzoa, Suborder Phylactolæmata, *Proc. Essex Institute*, IV and V, 1866–1868. — Leidy, J., *Urnatella Gracilis*, *Journ. Acad. Nat. Sci. Philad.*, 1883. — Potts, E., On *Paludicella Erecta*, *Proc. Acad. Nat. Sci. Philad.*,

<sup>1</sup> The *American Naturalist* will undertake to determine and return any specimens that cannot be placed in the keys, and solicits correction and criticism for future revision.

1884. — Kraepelin, K., Die Deutschen Süßwasserbryozoen, Teil I, *Abh. Naturw. Verein*, Hamburg, X, 1887; Teil II, *ibid.*, XII, 1893. — Braem, F., Untersuchungen ueber die Bryozoen des süßen Wassers, *Bibl. Zool.*, II, 1890. — Davenport, C. B., Cristatella: the Origin and Development of the Individual in the Colony, *Bull. Mus. Comp. Zool.*, Harvard, XX, 1890, and on Urnatella Gracilis, *Bull. Mus. Comp. Zool.*, Harvard, XXIV, 1893.